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PELLAGRA—OBSERVATIONS OF THIS DISEASE AS FOUND IN THE PEORIA STATE HOSPITAL

By MARY BIRD TALCOTT, R.N.

Graduate of the Illinois Training School, Chicago; Superintendent of Nurses, Peoria State Hospital, Peoria, Ill.

THE definition of this disease given by Sir Patrick Manson, M.D., in his book on "Tropical Diseases" reads as follows: "An epidemic disease of slow evolution, characterized by a complexity of nervous, gastric, and cutaneous symptoms, which make their first appearance during the spring months, and recur year after year at the same season, remitting more or less during the winter months. It is confined almost exclusively to field laborers, and the most distinctive features are (a) a remitting erythema of the exposed parts of the body, (b) marked emaciation, (c) profound melancholia alternating with mania."

When it is understood that the country people of Italy, where the disease is most prevalent, recognize seven distinct types of pellagra—(1) those that go mad, (2) those who are drawn to water, (3) those who go backwards, (4) those who are doubled up, (5) those who become giddy, (6) those who are always hungry, (7) those whose skin peels¹—the extreme variability of the symptoms and course of this disease may be assumed.

Before stating a few facts regarding my observations of pellagra, I am sure that a short history of this institution will be of interest. When the present Peoria State Hospital was built, its original purpose was to care for the incurable insane of Illinois; consequently, as can be readily understood, this hospital was formerly a dumping ground for the most undesirable, chronic demented from all the other institutions in the state, and also for the inmates of the almshouses throughout the state. During the year of 1904 six hundred of this deplorable class alone were admitted. This will, in a measure, explain why we have had so many more cases of pellagra in this hospital than in any other institution in Illinois. Also a very large majority of our patients are old men and women, the average age being forty-seven years. This, too, is another important factor, as pellagra is a disease peculiar to the middle aged.

¹ Sandwith's "Medical Diseases of Egypt," Part 1, 1905.

For several years it had been noticed that during the spring and summer months there were a large number of patients suffering from an erythema, due, it was thought, to exposure to the sun's rays. This hospital is built on the cottage plan, and each cottage is provided with ample verandas, so that it is possible to keep every patient on the shady side of the building during the whole of the day, and during the warm months it is customary to keep the patients out of doors every day that the weather will permit. We continued to find cases of excessive erythema with, in many instances, large bleb formations following. Nurses and attendants were cautioned over and over again in regard to this unfortunate condition, while in one or two instances dismissals were the result of alleged carelessness in this respect. Then, too, it was observed that during this season of the year there were many fatal cases of acute diarrhoea and enterocolitis. Many of these cases, it was also observed, showed skin lesions that were supposed to be sunburns. Each year extra precautions were observed in regard to the preparation and cooking of food, exclusion of flies, and all other sources of food contamination.

During the month of August, 1908, one of the staff physicians reported a case of what he suspected to be pellagra to the superintendent who immediately examined the patient and, to quote his words, "In one moment the scales of seven years fell from my eyes and I recognized the fact that we had had pellagra in this hospital for a number of years." Expert physicians from the Medical Department of the United States army, the Public Health and Marine-Hospital Service, and the State Board of Health were notified, and on examination these men confirmed the diagnosis. All patients in the hospital were thoroughly examined at once. The finding of about one hundred well-defined cases was the result. Our dietary was examined by these same physicians, and although corn products were given here as one of the staple articles of diet, they were not used to any greater extent than in all other institutions of this character, and the cause of the condition which prevailed here could not be attributed to that. But as a matter of fact scientific men have been for years investigating the etiology of the disease in Italy, where it prevails so extensively, with almost as many varying reasons for its cause as there are investigators. So we, too, thus far have been unable to throw any light upon the etiological factors of the disease as found in this hospital.

Whether pellagra is caused by an invasion of bacteria, or whether it is a toxic condition due to eating spoiled corn or its products, is a matter of speculation among the scientists who have studied the disease.

It is also uncertain whether it is a communicable disease, though most authorities agree that it is not directly so; and the conditions here would almost prove that theory, for the disease has never manifested itself among any of the nurses or attendants who have been caring for those who have been afflicted with it, but has been confined exclusively to the inmates, and among them it has been confined mostly to those who have been inmates of either an insane hospital or an almshouse for a long period of time. But even in this there are some exceptions of note, one of them being the case of the woman whose picture is shown, on whose arms there are well-defined lesions between the shoulders and elbows in addition to those of the forearms and hands. This woman had only been in this hospital nine months (she was admitted from her home on a farm) when the cutaneous symptoms were first observed. She was sent to the hospital ward where all the pellagrous cases were segregated and has since that time been of some assistance in helping the nurses care for her more unfortunate sisters. During this time she has had several acute exacerbations of her psychoses, but this condition has not been any more pronounced than it was before symptoms of pellagra were noticed. There were mouth symptoms of a mild character noted. The skin lesions cleared up in about twelve weeks, and she has been gradually gaining in weight since that time. She is still under daily observation and we are anxiously waiting to see if there will be a recurrence of these same lesions another season or whether the disease will manifest itself in a more severe type this year.

Some authorities suggest that it may be transmitted by bites of insects, but this has not been satisfactorily established. Other authorities state that it is a disease peculiar to the insane, and still others that insanity is one of the nervous manifestations of the disease in its terminal stage.

French's "Practice of Medicine" assigns "fermented or diseased maize or organisms growing on it" as the etiology of the disease, while Hare's "Practice of Medicine" (1909) divides the responsibility between alcohol and spoiled corn. In Wilcox's "Treatment of Disease" (1907) the disease is attributed to ptomaines from diseased corn or its products, with alcohol and malaria as predisposing causes. Stelwagon in "Diseases of the Skin" (1908) states that the disease has been found among people who have never eaten corn or its products, and emphasizes the importance of the sun's rays as a predisposing factor. Lombroso, who has devoted his life to the study of the disease in Italy, and upon whose observations the present conception of pellagra is largely based, contends that certain fungi which are found in maize



**SHOWING ERRATIC COURSE OF THE DISEASE.
PATIENT SUFFERED NO INCONVENIENCE.**



SHOWING SCALING EPIDERMIS AFTER ERYTHEMA AND VESICATION. NOTE ABSENCE OF ULCERATION OF NEWLY FORMED SKIN.

will, under some conditions, produce a toxin. These organisms may, with impunity, be injected into humans and animals, but when grown on a culture medium of cornmeal gruel develop toxins which, when injected into animals and men, give symptoms that are extremely variable but somewhat analogous to the symptoms of pellagra.

Of these symptoms there are many different types. In some the nervous symptoms predominate; in others, gastro-intestinal, cutaneous, ocular, while there is another form known as the acute typhoidal type. The secretary of the Illinois State Board of Health suggests, in the Monthly Bulletin of August, 1909, "If we add alcohol and sunlight to Radcliffe-Crocker's alliterative summary of the causal factors, *peasant life*, *poverty*, and *polenta* (a bread made from corn and used extensively among the peasant 'class of Italy), we should be as near to the truth, after all, as the more elaborate discussions of the subject have carried us."

Examinations of blood, urine, and fæces, with cultures from cases with stomatitis, and analyses of spinal fluids, also post-mortem examinations, have been extensively made in this hospital, with the hope that further field for scientific investigation might be discovered, but the problem remains unsolved as it has remained after many years of research by the scientific world.

Since last August there have been under observation and treatment in this hospital about ninety cases of pellagra among the women and seventy-five or eighty cases on the men's side. Of this number, about 50 per cent. of both men and women had the acute gastro-intestinal form, and only a very small proportion of those suffering from this type of the disease recovered, probably not more than five or six of the whole number affected. These patients had all the varying symptoms, though there were three or four of them who had no skin lesions. In many of these cases we have a history of one or more attacks of a milder type during previous seasons.

Anorexia with consequent loss in weight, malaise, depression of spirits, and vertigo are among the most prominent symptoms that first present themselves; followed later by small irregular patches of erythema, bright red in color, changing to a darker shade with petechia. The patient complains of intense itching and burning in the affected area. Bleb formation is extensive in many cases; some of these blebs are as large as the palm of the hand. Desquamation follows, and the epidermis peels off in large flakes.

The locality involved varies but most frequently begins with the dorsum of the hands and fingers, in some cases extending clear around the wrist, forming a complete girdle and showing involvement of the

palmar surfaces. The erythema may appear on the arms, around the neck, on the forehead, around the eyes, on the cheeks, or behind the ears, or on the feet and legs, and in one case an area extending the whole length of the spine was involved. One of the most striking of features noted is that sooner or later these lesions become perfectly symmetrical on both sides of the body. The line of demarcation is very distinct. After desquamation the skin is left a dark brownish color, rough and dry like parchment, hence the name pellagra, an Italian word meaning "rough skin."

In the milder cases these were all the symptoms developed, while in the more severe gastro-intestinal form there was a dreadful excoriation and sloughing of the external genitalia. Especially was this condition noticed among the women, about 20 per cent. of those suffering from this type of the disease showing this horrible condition; and I can assure my readers that in all my nursing career, both in this country and in the tropics, I have never seen any condition equal to that of patients suffering from this type of pellagra excepting, perhaps, those seen in the hospital for lepers in Manila, P. I. Among the men this condition was rare. I can only call to mind two or three where there was any involvement of the external genitalia.

Mouth symptoms showed themselves first in the tongue, which became denuded first about the edges, fiery red in color, rapidly spreading until the whole tongue, lips, and buccal mucous membrane were involved. The gums were spongy and inflamed, fine tremors of the tongue were often noted, and bleb formation and ulceration followed in a large per cent. of the cases. There was excessive salivation, so much so that in most cases towels were fastened about the neck, which required frequent changing to prevent the bed-clothing from becoming saturated with the saliva. The tongue often becomes swollen and stiff and it is with difficulty that it can be protruded far enough for inspection, or that the mouth can be opened enough to be kept properly cleansed, while it is almost impossible to induce the patient to take the necessary amount of nourishment owing to the extreme pain of deglutition.

Gastro-intestinal symptoms are vomiting and excessive diarrhoea with bloody stools. The temperature varies, but rarely goes higher than 102° F. during the acute attack, with morning and evening variations of from one to two degrees. This condition will continue several days, usually about eight or ten, then, as a rule, twenty-four or thirty-six hours before death occurs the temperature drops to 94° F. or 95° F., the patient in algid collapse. In many cases picking at the bed-clothes and subsultus tendinum is noted during the whole period of attack.



MAN, SHOWING OEDEMA AS WELL AS ERYTHEMA.



MAN, SHOWING MASTOID AND TEMPORAL INVOLVEMENT AS WELL AS OF HANDS.

Patients complain of excessive thirst, and this condition is especially noticed for two or three days prior to death, the patient begging for water continually. There is, of course, extreme emaciation, and exhaustion is rapid and pronounced. In some cases, where the attack is more chronic in form, these symptoms are not as acute; the patient suffering from this form runs a subnormal temperature for weeks, and in some instances this condition has prevailed for several months; the emaciation and exhaustion are of course more gradual.

Blood findings are of great interest and point to the fact that severe anæmia is always present, the blood counts showing that almost invariably there is some reduction in the red corpuscles, the hæmoglobin estimation is usually low; there have been no changes of importance noted in the white corpuscles except in one or two instances.

In the nervous symptoms profound depression and increased dejection and stupidity are prominent manifestations in most cases, though there may be occasional outbreaks of maniacal excitement. There are alterations of both sensation and motility, and in most instances the reflexes are exaggerated.

The prophylaxis and treatment, like the etiology, is indefinite and unsatisfactory. For the skin lesions, dressings of balsam of Peru, oxide of zinc ointment, and boracic acid powder are used; others were treated with tincture of iodine and peroxide of hydrogen. Where the external genitalia were involved, hot applications of saturated solutions of boric acid, normal salt solution and aluminum acetate, 10 per cent., were found very beneficial. In some of the cases where only the skin was involved, no treatment was used, and the results were quite as satisfactory. In fact, in several instances one hand would be treated and the other left exposed without treatment; the result, in instances, showing in favor of the exposed hand. Internally Lombroso recommends preparations of arsenic, and this drug has been used in this hospital more than any other one remedy—Fowler's solution, one minim t.i.d., increasing one minim each day until the maximum dose was given and then decreasing each day until the original quantity was reached, or arsenous acid, $\frac{1}{10}$ gr. hypodermically once daily, and thyroid extract, one to two grs. t.i.d. Atoxyl in maximum doses has been given in some cases twice weekly and in others once daily. Charcoal radium was also used in some instances. Perhaps the most satisfactory results were obtained in this hospital from the treatment of phosphorus, $\frac{1}{60}$ gr. t.i.d. A special serum therapy has been attempted, but so far without any satisfactory results. High rectal enemata of normal salt solution proved very beneficial and soothing and were used in a majority of the

cases. In others, enemata of quinine hydrochloride, 2 per cent., was prescribed.

The diet was strictly fluid in all the gastro-intestinal cases; in the other types, general diet with the elimination of all corn products was allowed. Some of the cases were treated with an exclusive diet of buttermilk, others were given an antiscorbutic diet, and in still others all liquids were allowed. Water was given freely in all cases.

Perhaps a few clinical notes, taken from the history of what was to me the most fascinating as well as the saddest case, will be of interest. This woman had been an inmate of a hospital for the insane for about twenty years and her psychosis was considered hopeless. Her family never expected to see her any better and had given up visiting her or writing to inquire about her condition except at long intervals. She had been a woman of education and refinement and was unmarried. She was considered by every one to be a hopeless dement, untidy and stupid, paying no attention even to the calls of nature. About a year ago the attendant in charge of the ward where she was confined noticed that her mental condition was improving and began to spend a great deal of time on her re-education, until finally she reached the point where she wrote a rational letter to her people. This was the first intimation they had of her improved condition. They took the first available opportunity to visit her, pleased beyond expression at the restoration of her mental faculties. When they reached here they declared that when her letter was received it was like hearing from one believed to be dead, and they could scarcely realize the possibility of such a change. Her mental condition gradually grew better and better, while her manners, though a little childish, with her naturally sweet disposition made her charming and she was the pet of every one who came in contact with her. She was an inveterate reader and had free access to the hospital library. Her people came to visit her frequently, taking her down town to hotels to dinner and occasionally to the theatre, until it was finally decided she was well enough to go home and live a normal life once more.

Two days before her nephew was to come for her, I met her on the walk coming from the laundry, where she had been to do some little extra work for herself in preparation for her departure. As she stood chatting with me and telling me of her anticipated joy in seeing her old friends once more, I noticed that the joints of her fingers and knuckles of the hand were very red, but when I examined them more closely she laughed and said she had had her hands in very hot starch and that they did not feel sore at all. I hoped that she was right, but I was

worried about it and reported the matter to the physician in charge. Two days later her nephew came for her, and as her hands still remained in the same condition, he was advised to leave her here for a few weeks longer and await results. The following clinical notes will tell her sad story, surely one of the many tragedies in life's mysteries as we find them depicted in hospitals of this character.

She was kept under close observation and received treatment in the ward for several weeks. Her mental condition remained unchanged. Physically, she grew gradually weaker, losing in weight, skin lesions of the hands extended. Later an erythema of the nose developed, spreading to resemble the shape of a butterfly. It continued to extend until the forehead and cheeks were involved. There were also excoriations around the anus. On November 19, 1909, she walked to the hospital ward, a distance of two or three blocks, and was put to bed. The following is quoted from the notes of the nurse who had charge of her case:

"November 11, 1909. Lips and mouth very red, tongue red and swollen, with ulcers underneath. Face bright red, neck brown, hands dark red and rough to the wrists, with areas between both thumbs and first finger that have open sores on them. Appetite poor and bowels loose, stools brown in color and very offensive.

"November 20. Small ulcers of mouth, tongue, and gums. Patient resting. Excoriations have extended from the anus to the vulva, vagina red, some pus. Face very red.

"November 21. Very little change in mouth and tongue, excessive salivation. Patient restless.

"November 22. Patient quiet and resting, no other change noted.

"November 23. Weight, seventy-five and one-fourth pounds. Face red and dry in places.

"November 24. Stools less frequent, mouth looks better.

"November 25. Mouth worse, patient complains of extreme pain and burning in mouth, begs for water constantly. Tongue heavy and moved with difficulty.

"November 26. Patient very weak, excoriation of genitalia worse. Mental condition slightly cloudy.

"November 27. Face very red, chin dry and rough, showing a tendency to fissure.

"November 28. Fingers and palms of both hands very red (this condition is rare), complains of burning and pain. Excoriations bleeding.

"November 29. No change in patient's condition.

"November 30. Patient too weak to be weighed. Has had invol-

untary evacuations of bowels for the first time to-day. Face, especially about the mouth and chin, dry and fissured. Discharge from mouth of mucus streaked with blood. Hands very dark purplish, palmar surfaces affected, only a small area of normal skin about one-half inch in diameter on radial side. Feet cold and cyanotic. Knees and elbows red. No change in the excoriation of genitalia. Patient complains of no pain, only feels extremely weak and sleepy. Was conscious until death, which occurred at six-thirty p.m."

The first five days in bed the temperature was 100° F. to 101° F. After that it began to decline and three days prior to death it was subnormal. Two hours before death the temperature was normal. Pulse ranged from eighty to one hundred, and the respiration from eighteen to twenty-four.

And so, just as the dark cloud that had enveloped her in its mist for so many long years was beginning to lift, and she began to catch bright glimpses of the sun that is surely shining behind every cloud, she passed on, beyond all clouds, into the great and mysterious Unknown.

THE SPECIALLY TRAINED OBSTETRIC NURSE—HER ADVANTAGES AND FIELD*

By HERBERT MARION STOWE, M.D.

Associate in Obstetrics, Northwestern University Medical School; Attending Obstetrician to Cook County, Provident, and Prospect Hospitals; Adjunct Obstetrician to Wesley Hospital; Assistant Obstetrician to the Chicago Lying-in Hospital.

THE ability to employ all the arts and gifts of knowledge in the accomplishment of any endeavor is the sole province of the specialist. To be master of the situation in moments of great crises is his special privilege and duty. In the field of medicine, the specialist has to deal with conditions of great complexity and intricacy, and upon his decision and judgment rests the welfare of mankind. At the present time, the almost universal desire for knowledge, not only general but particular, for experimentation and for investigation have made the specialist a necessity and his field of action is based upon a firm and lasting foundation.

Probably in no other field of medical activity is so much required

* Presented to the Chicago Society of the Superintendents of Training Schools for Nurses, March 5, 1910.